CALIFORNIA
High-Speed Rail Authority

June 2, 2011

Mr. Zachary Simmons
Regulatory Project Manager
U.S. Army Corps of Engineers
650 Capitol Mall, Suite 5-200
Sacramento, CA 95814

Ms. Jennifer Blonn
High-Speed Rail, NEPA Lead
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street, CED-2
San Francisco, CA 95104

Dear Mr. Simmons and Ms. Blonn:

Our April 21, 2011, letter summarized information regarding the Fresno to Bakersfield High-Speed Train project Checkpoint B of the NEPA/Section 404 coordination process. Your agencies requested we clarify information in that letter and include additional information on the Hanford and Bakersfield area alternatives. In response to those requests, this letter contains the following:

- Revised Attachment B, Table of Alternatives, clarifies the alternative decisions.
- Revised Attachment C, Alternatives Maps: Figure C-1 has been revised to show the heavy maintenance facility sites considered in the Fresno to Bakersfield Section.
- Revised Attachment F, Comparison of Alternatives in the Hanford, Corcoran, Wasco, and Shafter Areas, revises the displacements, visual impacts, and noise and vibration impacts associated with these alternatives. The information compares alternatives of equal length. The Hanford and Corcoran area alternatives are evaluated from South Peach Avenue in the north to Avenue 136 in the south. The Wasco and Shafter area alternatives are evaluated from Whistler Road in the north to Hageman Road in the south.
- Revised Attachment G, Other Information on Alternatives, provides additional information on the Hanford East and Hanford West alternatives and information on the Through Hanford Alternative and the Bakersfield alternatives.

The U.S.EPA also requested information regarding coordination with the U.S. Fish and Wildlife Service (USFWS) on project alternatives. We first introduced project alternatives to the USFWS on September 25, 2009. As a result of this meeting, we added the Allensworth Bypass Alternative to avoid Allensworth Ecological Reserve impacts and wetland habitat near the BNSF Railway in the Allensworth area. The USFWS also requested we consider wildlife crossings at appropriate locations along the entire alignment. Those crossings have been developed in coordination with Mr. Brian Cypher, as recommended by the USFWS.

We subsequently reviewed project alternatives with USFWS staff on March 17, 2010, and May 19, 2010, and have continued to meet with the USFWS as recently as May

24, 2011, to discuss the Biological Assessment. The USFWS did not provide additional suggestions regarding alternatives at these meetings.

Should you have any questions, please contact Bryan Porter at (916) 384-9522 or via email at porter@pbworld.com. We appreciate your help in completing the Checkpoint B concurrence process.

Sincerely,

Luis V. Jiménez for

Dan Leavitt
Deputy Director, CHSRA

Enclosures

cc: David Valenstein and Melissa DuMond, FRA
Connell Dunning, USEPA
Veronica Chan, Los Angeles District, USACE
Ann Koby and Tom Tracy, CHSRA PMT

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection	Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010				Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
			Initial Screening		Detailed Screening					
FRESNO SUBSECTION	NA	NA	Alternative Family 1: HST on east side of UPRR Right-of-way	Alternative 1-1 carried forward and **RENAMED B2 and B5**	**B2** UPRR East elevated through Fresno to BNSF Corridor	**CARRIED FORWARD**	NA	NA	**ELIMINATED** UPRR East RENAMED Fresno East. This alternative would result in the demolition or relocation of the Southern Pacific Railroad Depot, a Section 4(f) property. (See p. 3-2)	
					B5 UPRR East elevated through Fresno to UPRR Corridor	**ELIMINATED** Would affect historic Southern Pacific depot, also infeasible due to elimination of UPRR route in Rural Subsection. (See pp. 4-1 - 4-20)				
				Alternative 1-2 carried forward and **RENAMED B8 and B11**	**B8** UPRR East at grade through Fresno to BNSF Corridor	**ELIMINATED** Would affect historic Southern Pacific depot, disrupt existing infrastructure, and affect the most sensitive noise and vibration receptors. (See pp. 4-1 - 4-20)				
					B11 UPRR East at grade through Fresno to UPRR Corridor	**ELIMINATED** Would affect historic Southern Pacific depot, also infeasible due to elimination of UPRR route in Rural Subsection. (See pp. 4-1 - 4-20)				
				ELIMINATED Alternative 1-3 would require 7 miles of tunnel through Fresno and an underground station, making this alternative cost prohibitive. (See pp. 3-9 - 3-12)						
				ELIMINATED Alternative 1-4 would require complex design and disruption of street grid. (See pp. 3-9 - 3-12)						
				ELIMINATED Alternative 1-5 would require complex design and disruption of street grid. (See pp. 3-9 - 3-12)						

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection	Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010				Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
			Initial Screening		Detailed Screening					
FRESNO SUBSECTION	NA	NA	Alternative Family 2: HST on the west side of UPRR Right-of-way	Alternative 2-1 carried forward and **RENAMED B1 and B4**	**B1** UPRR West elevated through Fresno to BNSF Corridor	**CARRIED FORWARD**	NA	NA	**ELIMINATED** UPRR West RENAMED as part of the BNSF Alternative. Cost of elevated structure through Fresno ($500 Million) would make the project infeasible.	
					B4 UPRR West elevated through Fresno to UPRR Corridor	**ELIMINATED** Infeasible due to elimination of UPRR route in Rural Subsection. (See pp. 4-1 - 4-20)				
				Alternative 2-2 carried forward and **RENAMED B7 and B10**	**B7** UPRR West at grade through Fresno to BNSF Corridor	**ELIMINATED** Would sever SJVR connections, disrupt existing infrastructure, and result in direct impacts to Roeding Park. (See pp. 4-1 - 4-20)			**REINTRODUCED as a result of the Value Engineering Study of February 2011.** Impacts to Roeding Park would be avoided as HST would be constructed within the Golden State Boulevard right-of-way. Engineering design has been modified to include bridges for the SJVR connections, with HST traveling below grade in an approximately 1.5 mile trench. Authority and City of Fresno developed plan to minimize impacts to local road network.	**BNSF ALTERNATIVE ALIGNMENT**
					B10 UPRR West at grade through Fresno to UPRR Corridor	**ELIMINATED** Infeasible due to elimination of UPRR route in Rural Subsection. (See pp. 4-1 - 4-20)				
				ELIMINATED Alternative 2-3 would require 7 miles of tunnel through Fresno and an underground station, making this alternative cost prohibitive. (See pp. 3-9 - 3-12)						
				ELIMINATED Alternative 2-4 would require complex design and disruption of street grid. (See pp. 3-9 - 3-12)						
				ELIMINATED Alternative 2-5 would require complex design and disruption of street grid. (See pp. 3-9 - 3-12)						

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection	Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010				Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
			Initial Screening		Detailed Screening					
FRESNO SUBSECTION	NA	NA	Alternative Family 3: Golden State Boulevard	Alternative 3-1 carried forward and **RENAMED B3, B6, B9, and B12**	**B3** Golden State Boulevard elevated through Fresno to BNSF Corridor	**ELIMINATED** Would result in greatest impact to Roeding Park, involve complex design and construction, and sever SJVR or require costly realignment to a new route. Also located farthest from preferred station location. (See pp. 4-1 - 4-20)				
					B6 Golden State Boulevard elevated through Fresno to UPRR Corridor	**ELIMINATED** Infeasible due to elimination of UPRR route in Rural Subsection. (See pp. 4-1 - 4-20)				
					B9 Golden State Boulevard at grade through Fresno to BNSF Corridor	**ELIMINATED** Would result in greatest impact to Roeding Park and involve complex design and construction. The four-track cross-section for the station is approximately twice as long as Alts B1 and B2. Also located farthest from preferred station location. (See pp. 4-1 - 4-20)				
					B12 Golden State Boulevard at grade through Fresno to UPRR Corridor	**ELIMINATED** Infeasible due to elimination of UPRR route in Rural Subsection. (See pp. 4-1 - 4-20)				
				ELIMINATED Alternative 3-2 would require more than 7 miles of tunnel through Fresno and an underground station, making this alternative cost prohibitive. Also could affect subsurface cultural resources in Chinatown. (See pp. 3-9 - 3-12)						
	NA	NA	NA	NA	**B13** UPRR West/UPRR East Crossover Alternative (Hybrid of Alts B1 and B2)	**CARRIED FORWARD** Alternative was carried forward in MF EIR/EIS and subsequently eliminated because it is not viable with an at-grade alternative through Fresno.				
	NA	NA	Alternative 4: State Route 99	**ELIMINATED** Would traverse Roeding Park and require station farthest from central business district. Also least consistent with local planning objectives. (See pp. 3-9 - 3-12)						
	NA	NA	Option 2: Fresno Western Bypass Option	**ELIMINATED** Would impact agricultural lands west of Fresno, add design/construction complexity, and was opposed by both the City and County of Fresno. (See pp. 3-9 - 3-12)						

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection	Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010				Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
			Initial Screening		Detailed Screening					
RURAL SUBSECTION	**A** BNSF Refined (through central Hanford on BNSF)	**Alternative through Hanford ELIMINATED** BNSF geometry limitations through Hanford requires routing HST through central residential neighborhoods, commercial and industrial districts. Alt D-2 incorporated as new baseline Alternative A.	**A** Baseline BNSF Hanford West Bypass	**CARRIED FORWARD and RENAMED CPAA**	**CPAA** Hanford West Bypass (No Station)	**ELIMINATED** Would not provide a potential station in the Visalia-Tulare-Hanford area, inconsistent with local land use plans, and would result in greater impacts to seasonal wetlands, waters of the U.S., riparian habitat, threatened or endangered species habitat, and important farmland than the Hanford East Bypass (Alternative C1) (See pp. 4-21 - 4/49 and Attachment F to April 21, 2011 Authority letter)				
	B UPRR Refined (entire alignment follows UPRR with the exception of the entrance to Bakersfield)	Alternative B was expanded into Alternatives B-1, B-2, D-1, D-2, E-1, and E-2 to evaluate a range of alignments in the UPRR corridor.								
	C-1 UPRR diverted west (from Kingsburg to Fowler)	**C-1, B, D-3, and E COMBINED to form New B-1, D-1, and E-1**	**B-1** UPRR Fresno South Below Grade	**ELIMINATED** Would require trench construction, greater community impacts, and UPRR cooperation. (See pp. 3-16 - 3-23)						
			D-1 UPRR to BNSF (198 Station) - Fresno South Below Grade	**ELIMINATED** Would require trench construction and UPRR cooperation. (See pp. 3-16 - 3-23)						
			E-1 UPRR to BNSF (99 Station) - Fresno South Below Grade	**ELIMINATED** Would result in major adverse environmental impacts to vernal pools and Allensworth Ecological Reserve, and require trench construction and UPRR cooperation. (See pp. 3-16 - 3-23)						
	C-2 UPRR diverted east (from Kingsburg to Fowler)	**ELIMINATED** Would Impact high-value agricultural area known as Golden Triangle. (See pp. 31 - 44)								

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection	Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010				Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
			Initial Screening		Detailed Screening					
RURAL SUBSECTION	C-3 UPRR below grade (below grade from Kingsburg to Fowler)	C-3 below-grade segment **COMBINED with B, D-3, and E to form new B-2, D-2, and E-2**	**B-2** UPRR Fresno South Bypass	**ELIMINATED** Fewer construction and community impacts than Alt B-1, but greater impacts to agricultural land. Would require UPRR cooperation. (See pp. 3-16 - 3-23)						
			D-2 UPRR to BNSF (198 Station) - Fresno South Bypass	**Alternative D-2 CARRIED FORWARD and RENAMED C4, C5, and C6**	**C4** UPRR to BNSF, Visalia Station - Shared Right-of-way	**ELIMINATED** Would travel longer route than BNSF Alts resulting in longer travel time, only partially follows the Authority's objective to maximize use of exisiting transportation corridors. (See pp. 4-21 - 4-49)				
					C5 UPRR to BNSF, Visalia Station - Separate Side Alignment	**ELIMINATED** Would travel longer route than BNSF Alts resulting in longer travel time, does not maximize use of exisiting transportation corridors. (See pp. 4-21 - 4-49)				
					C6 UPRR to BNSF, Visalia Station - East Side Alignment	**ELIMINATED** Would travel longer route than BNSF Alts resulting in longer travel time, does not maximize use of exisiting transportation corridors. (See pp. 4-21 - 4-49)				
			E-2 UPRR to BNSF (99 Station) - Fresno South Bypass	**ELIMINATED** As with Alt E-1, Alt E-2 would result in major adverse environmental impacts to vernal pools and Allensworth Ecological Reserve. (See pp. 3-16 - 3-23)						
	D-1 BNSF Hanford East Bypass via SR 43	**CARRIED FORWARD and RENAMED A-1**	**A-1** BNSF Hanford East Bypass, at grade	**Alternative A-1 CARRIED FORWARD and RENAMED C1, C2, and C3**	**C1** BNSF Hanford East Bypass, Hanford Station - Shared Right-of-way	**CARRIED FORWARD**	**Alternative C1**	**CARRIED FORWARD**	**POTENTIAL OPTION** Agreement with BNSF for shared right-of-way may not be accomplished in this area. Separate side alignment reintroduced for purpose of EIR/EIS. The Authority continues to work with BNSF to utilize a shared right-of-way.	
					C2 BNSF Hanford East Bypass, Hanford Station - Separate Side Alignment	**ELIMINATED** Similar to Alt C1 but with greater land use impacts. (See pp. 4-21 - 4-49)			**Reintroduced as Alignment A-1 (formerly C1)** **RENAMED BNSF ALTERNATIVE ALIGNMENT**	**BNSF ALTERNATIVE ALIGNMENT** (The potential Kings/Tulare Regional Station would be located east of the City of Hanford along the BNSF Alternative, to the east of SR 43 and north of the Cross Valley Rail Line.)
					C3 BNSF Hanford East Bypass, Hanford Station - East Side Alignment	**ELIMINATED** Increased impacts to Allensworth Ecological Reserve and does not maximize use of existing transportation corridors. (See pp. 4-21 - 4-49)				
	D-2 BNSF Hanford West Bypass (generally same bypass of Hanford in programmatic EIR/EIS)	**ELIMINATED** Incorporated as baseline A (See pp. 31 - 44)								

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection	Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010		Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
			Initial Screening	Detailed Screening				
RURAL SUBSECTION	**D-3** BNSF Hanford Far-East Bypass (SR - 198 Station)	**ELIMINATED** Reconfigured to merge into UPRR corridor on north end and combined with C-1 and C-3. **RENAMED D-1 and D-2** (See FB Preliminary Alternatives Analysis Report)						
	E UPRR to BNSF 99 (SR 99 Station)	**ELIMINATED** Combined with C-1 and C-3 on north end and **RENAMED E-1 and E-2.** (See FB Preliminary Alternatives Analysis Report)						
	F UPRR to BNSF 198 (SR 198 Station)	**ELIMINATED** Potential station location too remote and located in floodplain. (See pp. 31 - 44)						
	F-1 BNSF to BNSF (Center of Valley)	**ELIMINATED** Potential station location too remote and located in floodplain. (See pp. 31 - 44)						
	G-1 BNSF to UPRR 99 (SR 99 Station)	**ELIMINATED** Alignment similar to new Alt B-1 (formerly Alt C-1) but would impact more farmland. (See pp. 31 - 44)						
	G-2 BNSF to UPRR 198 (SR 198 Station)	**ELIMINATED** Potential station location too remote and located in floodplain. (See pp. 31 - 44)						
	NA	NA	**3-B** BNSF Straight South of Corcoran West	**ELIMINATED** Inconsistent with Purpose and Need objective to combine transportation corridors and minimize impacts on agricultural land. (See pp. 3-16 - 3-23)				
	NA	NA	**3-C** BNSF Straight South of Corcoran East	**ELIMINATED** Would result in major adverse environmental impacts to Pixley National Wildlife Refuge and Allensworth Ecological Reserve. As with Alt 3-B, inconsistent with Project Purpose and Need. (See pp. 3-16 - 3-23)				

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection		Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010				Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
				Initial Screening		Detailed Screening					
RURAL SUBSECTION	Rural Subsection: Local Options	NA	NA	NA	NA	NA	NA	**H1** Hanford Through-town/Downtown Station	**ELIMINATED** Increased residential, business, and noise impacts compared to Alt C-1. Reduced connectivity for potential regional station. (See Supplemental AA Report)		
		NA	NA	NA	NA	NA	NA	**H2** Hanford Through town/Southern Station	**ELIMINATED** Increased residential, business, and noise impacts compared to Alt C-1. Reduced connectivity for potential regional station. (See Supplemental AA Report)		
		NA	NA	NA	NA	**CTT1A** Corcoran at grade through town	**ELIMINATED** Would impact existing road network and BNSF tracks. (See pp. 4-21 - 4-49)			**REINTRODUCED as a result of the Value Engineering Study of March 2011.**	**BNSF ALTERNATIVE ALIGNMENT**
		NA	NA	NA	NA	**CTT1B** Corcoran elevated through town	**CARRIED FORWARD**	NA	NA	**ELIMINATED** Cost of elevated structure through Corcoran may be excessive.	**REINTRODUCED AS CORCORAN ELEVATED ALTERNATIVE ALIGNMENT**
		NA	NA	NA	NA	NA	NA	NA	NA	**KAWEAH BYPASS** At-grade alignment developed to avoid special aquatic resources in the Cross Creek Complex north of Corcoran.	**BNSF ALTERNATIVE ALIGNMENT**
		NA	NA	NA	NA	NA	NA	NA	NA	**KAWEAH-CORCORAN BYPASS** At-grade alignment developed to avoid the special aquatic resources in the Cross Creek Complex and community impacts to the City of Corcoran.	**CORCORAN BYPASS ALTERNATIVE ALIGNMENT**
		NA	NA	NA	NA	**CTT1C** Corcoran Bypass at grade	**CARRIED FORWARD**	NA	NA	Alternative CTT1C **RENAMED CORCORAN BYPASS ALTERNATIVE ALIGNMENT**	**ELIMINATED** This original Corcoran Bypass which was designed to avoid community impacts to the City of Corcoran was eliminated and replaced by the New Corcoran Bypass (above) which avoids special aquatic resources in the Cross Creek Complex and avoids community impacts to Corcoran (referred to as the "Kaweah-Corcoran Bypass" in the Checkpoint B Summary Report of March 2011).
		NA	NA	NA	NA	**CBPA** Fowler, Selma, Kingsburg Bypass via Greenfield west of towns	**ELIMINATED** Infeasible due to elimination of Alts C4, C5, and C6. (See pp. 4-21 - 4-49)				
		NA	NA	NA	NA	**CBPB** Fowler, Selma, Kingsburg Bypass just west of town limits	**ELIMINATED** Infeasible due to elimination of Alts C4, C5, and C6. (See pp. 4-21 - 4-49)				
		NA	NA	NA	NA	**CVSA** Visalia Station Alignment 198 East	**ELIMINATED** Would require longer travel time, greater impacts to agricultural land, and inconsistent with Program EIR/EIS Preferred Alignment. (See pp. 4-21 - 4-49)				

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection		Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010				Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
				Initial Screening		Detailed Screening					
RURAL SUBSECTION	Rural Subsection: Local Options	NA	NA	NA	NA	**CVSB** Visalia Station Alignment 99 Center (South of SR 198)	**ELIMINATED** Would require longer travel time, greater impacts to agricultural land, and inconsistent with Program EIR/EIS Preferred Alignment. (See pp. 4-21 - 4-49)				
		NA	NA	NA	NA	**CVSC** Visalia Station 99 North (Goshen)	**ELIMINATED** Would require longer travel time, greater impacts to agricultural land, and inconsistent with Program EIR/EIS Preferred Alignment. (See pp. 4-21 - 4-49)				
		NA	NA	NA	NA	**CAAA** Allensworth Bypass at grade	**CARRIED FORWARD**	NA	NA	Alternative CAAA **RENAMED ALLENSWORTH BYPASS ALTERNATIVE ALIGNMENT**	**ALLENSWORTH BYPASS ALTERNATIVE ALIGNMENT**
		NA	NA	NA	NA	**CTT2A** Wasco and Shafter at grade	**ELIMINATED** Major impacts to the existing road networks and BNSF operations in both Wasco and Shafter. (See pp. 4-21 - 4-49)				
		NA	NA	NA	NA	**CTT2B** Wasco and Shafter elevated	**CARRIED FORWARD**	NA	NA	Alternative CTT2B **RENAMED as part of the BNSF ALTERNATIVE ALIGNMENT** (Alignment elevated only through Wasco and Shafter, at grade between the two cities)	**BNSF ALTERNATIVE ALIGNMENT**
		NA	NA	NA	NA	**CTT2C** Bypass of Wasco, at grade through Shafter	**ELIMINATED** Major impacts to the existing road network and BNSF operations and facilities in Shafter. (See pp. 4-21 - 4-49)				
		NA	NA	NA	NA	**CTT2D** Bypass of Wasco and Shafter at grade	**CARRIED FORWARD**	NA	NA	Alternative CTT2D **RENAMED WASCO-SHAFTER BYPASS ALTERNATIVE ALIGNMENT**	**WASCO-SHAFTER BYPASS ALTERNATIVE ALIGNMENT**
		NA	NA	NA	NA	**CTT2E** Elevated through Wasco, at grade through Shafter	**ELIMINATED** Major impacts to the existing road network and BNSF operations and facilities in Shafter. (See pp. 4-21 - 4-49)				
		NA	NA	NA	NA	**CTT2F** At grade through Wasco, elevated through Shafter	**ELIMINATED** Major impacts to the existing road network and BNSF operations in Wasco. Major community impacts and possible environmental justice issues on the eastern side of the city. (See pp. 4-21 - 4-49)				
		NA	NA	NA	NA	**CTT2G** 7th Standard Road East Bypass	**ELIMINATED** Major impacts on agricultural land and planned mixed use development. Possible impact on planned 7th Standard Road reconstruction. Opposed by City of Bakersfield. (See pp. 4-21 - 4-49)				

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

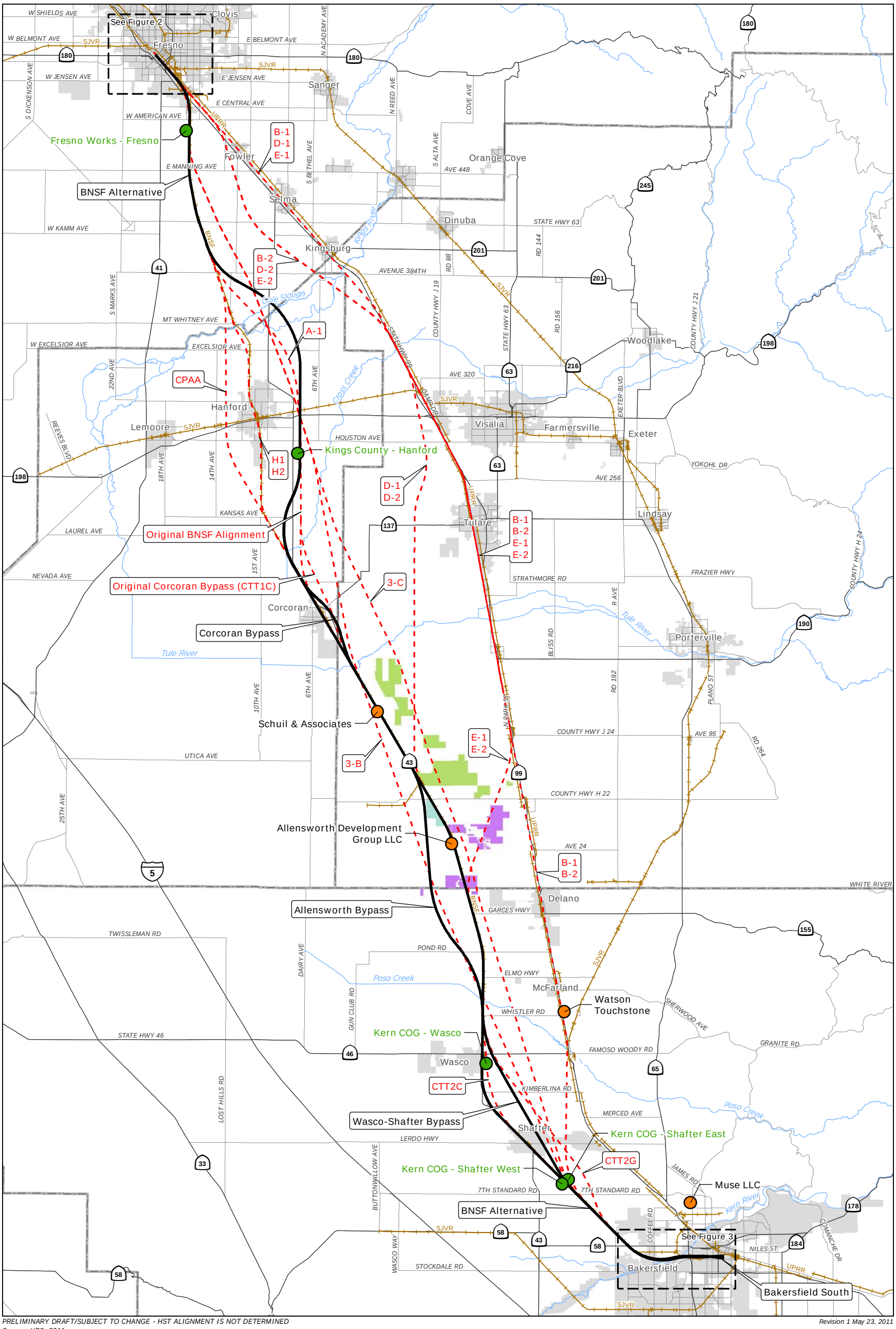
Alignment Subsection	Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010				Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
			Initial Screening		Detailed Screening					
BAKERSFIELD SUBSECTION	NA	NA	Alternative Family 1: Circumventing Flying-J Refinery	Alternative 1A carried forward and **RENAMED D1-N and D1-S**	**D1-N** Elevated alignment north of UPRR, reduced speed	**ELIMINATED** Large number of residential displacements in environmental justice community, displace power transmission substation, skewed straddle bent structure crossing UPRR to maintain design speed is not practicable. (See pp. 4-50 - 4-59)				
					D1-S Elevated alignment south of UPRR, reduced speed	**CARRIED FORWARD**	NA	NA	Alternative 1A (formerly D1-S) **RENAMED as part of the BNSF ALTERNATIVE ALIGNMENT**	**BNSF ALTERNATIVE ALIGNMENT**
				ELIMINATED Alternative 1B would not maintain reasonable operating speeds and would result in substantial land use impacts. (See pp. 3-28 - 3-32)						
				ELIMINATED Alternative 1C would not maintain reasonable operating speeds and would result in substantial land use impacts. (See pp. 3-28 - 3-32)						
				Alternative 1D carried forward and **RENAMED D2-N and D2-S**	**D2-N** Elevated alignment north of BNSF in Central Bakersfield, optimal speed	**CARRIED FORWARD**	NA	NA	Alternative 1D (formerly D2-N) **RENAMED BAKERSFIELD SOUTH ALTERNATIVE ALIGNMENT**	**BAKERSFIELD SOUTH ALTERNATIVE ALIGNMENT**
					D2-S Elevated alignment over BNSF in Central Bakersfield, optimal speed	**ELIMINATED** Construction of 3-mile elevated structure above BNSF yard and mainline tracks is not practicable. (See pp. 4-50 - 4-59)				
				ELIMINATED Alternative 1E would result in business displacements, impacts to Bakersfield High and California Avenue, and require complex construction to access downtown station. (See pp. 3-28 - 3-32)						

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection	Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010			Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
			Initial Screening		Detailed Screening				
BAKERSFIELD SUBSECTION	NA	NA	Alternative Family 2: Most closely followed path of Program EIR/EIS Preferred Alignment	**ELIMINATED** Alternative 2A would travel through the Flying-J Refinery and result in potential impacts to a Section 4(f) property. (See pp. 3-28 - 3-32)					
				ELIMINATED Alternative 2B would travel through the Flying-J Refinery and fail to maintain reasonable operating speeds. (See pp. 3-28 - 3-32)					
				ELIMINATED Alternative 2C would travel through the Flying-J Refinery and displace the most residential parcels of all alternatives, with the least favorable station placement. (See pp. 3-28 - 3-32)					
	NA	NA	Alternative 3: Centennial Corridor	**ELIMINATED** Failed to maintain required speeds along this corridor without cutting through established residential communities. (See pp. 3-28 - 3-32)					
	NA	NA	Alternative 4: Avoid downtown Bakersfield	**ELIMINATED** Would not meet the Project Purpose and Need of providing a downtown station. (See pp. 3-28 - 3-32)					

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED

Revision 1 May 23, 2011

Source: URS, 2011.

- *Alternatives carried forward*
- *Alternatives not carried forward*
- *Existing rail line*
- *Major road*
- *Heavy maintenance facility (carried forward)*
- *Heavy maintenance facility (not carried forward)*
- *County boundary*
- *Allensworth State Historic Park*
- *Allensworth Ecological Reserve*
- *Pixley National Wildlife Refuge*
- *Community/Urban area*

N

0 5 10 Miles

0 10 20 Kilometers

Figure C-1
Fresno to Bakersfield Alignment Alternatives

Comparison of Alternatives Considered in the Hanford, Corcoran, Wasco, and Shafter Area

Alternatives[a]				Hanford West	Hanford East *(BNSF - Through Corcoran on Map T-1)*	Corcoran Bypass *(BNSF - Corcoran Bypass on Map T-1)*	Kaweah Bypass *(Part of BNSF Alternative Carried Forward)*	Kaweah/Corcoran Bypass *(Corcoran Bypass Carried Forward)*	BNSF - Through Wasco and Shafter *(Part of BNSF Alternative Carried Forward)*	Wasco-Shafter Bypass *(Wasco-Shafter Bypass Alternative Carried Forward)*	Wasco-Shafter-7th Standard Road Bypass
Category	**Measurement**										
	Total Footprint Impact Acreage			**429.74**	**332.24**	**407.05**	**401.85**	**409.79**	**168.33**	**236.38**	**250.45**
Impacts to Special Aquatic Resources				**Impact Acreage**							
	Seasonal Wetlands			0.31	0	0	0.02	0	0.35	0	0
	Vernal Pools			0	3.79[b]	5.6	0	0	0	0	0
	Riverine			0.84	0.4	0.51	0.8	0.82	0	0	0
	Riparian			0.85	0.84	0.97	0.97	0.86	0	0	0
	Lacustrine			0	0	0	0	0	0	0	0
	Canals/Ditches			4.06	2.57	2.83	8.66	2.36	3.57	0.46	1.38
	Retention/Detention Basins			0.62	0.26	0.3	0.26	0.27	0.13	0.25	0.08
				Number of features intersected by alignment							
	Seasonal Wetlands			3	1	0	1	0	2	0	0
	Vernal Pools			0	6	5	0	0	0	0	0
	Riverine			9	6	11	14	10	0	0	0
	Riparian			16	10	19	20	12	0	0	0
	Lacustrine			0	0	0	0	0	0	0	0
	Canals/Ditches			42	35	40	47	43	7	17	16
	Retention/Detention Basins			3	3	4	3	4	5	4	2
Impacts to Potential Habitat for Federal and State Endangered and Threatened Species and		**Federal Status**	**State Status**								
	Plants			**Impact Acreage**							
	California jewel-flower *(Caulanthus californicus)*	FE	SE/1B.1	3.39	1.02[e]	12.42[e]	0	0[c]	0.13	0.01	2.64
	Hoover's spurge (Chamaesyce hooveri)	FT	1B.2	0.31	3.79[b]	5.6	0.02	0[c]	0.35	0	0
	Hoover's spurge (*Chamaesyce hooveri*) *CRITICAL HABITAT*	D	--	0	0	0	0	0[c]	0	0	0
	Kern mallow (*Eremalche kernensis*)	FE	1B.1	3.39	1.02[e]	12.42[e]	0	0[c]	0.13	0.01	2.64
	San Joaquin woolly threads (*Monolopia congdonii*)	FE	1B.2	3.39	1.02[e]	12.42[e]	0	0[c]	0.13	0.01	2.64
	Bakersfield cactus (*Opuntia basilaris var. treleasei*)	FE	1B.1	3.39	1.02[e]	12.42[e]	0	0[c]	0.13	0.01	2.64
	San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*)	FT	1B.1	0.31	3.79[b]	5.6	0.02	0[c]	0.35	0	0
	San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*) *CRITICAL HABITAT*	D	--	0	0	0	0	0[c]	0	0	0
	San Joaquin adobe sunburst (*Pseudobahia peirsonii*)	FT	SE/1B.1	3.39	1.02[e]	12.42[e]	0	0[c]	0.13	0.01	2.64
	Invertebrates			**Impact Acreage**							
	VERNAL POOL FAIRY SHRIMP (*Branchinecta lynchi*)	FT	--	0	3.79[b]	5.60	0	0[c]	0	0	0.00
	VERNAL POOL FAIRY SHRIMP (*Branchinecta lynchi*) *CRITICAL HABITAT*	D	--	0	0	0	0	0	0	0	0
	VALLEY ELDERBERRY LONGHORN BEETLE (*Desmocerus californicus dimorphus*)	FT	--	0.85	0.84	0.97	0.97	0.86	0	0	0.00
	VERNAL POOL TADPOLE SHRIMP (*Lepidurus packardi*) VERNAL POOL TADPOLE SHRIMP	FE	--	0	3.79[b]	5.60	0	0[c]	0	0	0.00
	VERNAL POOL TADPOLE SHRIMP (*Lepidurus packardi*) *CRITICAL HABITAT*	D	--	0	0	0	0	0	0	0	0

Comparison of Alternatives Considered in the Hanford, Corcoran, Wasco, and Shafter Area

Alternatives[a]				Hanford West	Hanford East (BNSF - Through Corcoran on	Corcoran Bypass (BNSF - Corcoran Bypass on Map	Kaweah Bypass (Part of BNSF Alternative Carried	Kaweah/Corcoran Bypass (Corcoran Bypass Carried	BNSF - Through Wasco and Shafter (Part of BNSF Alternative Carried	Wasco-Shafter Bypass (Wasco-Shafter Bypass	Wasco-Shafter-7th Standard Road Bypass
California Fully Protected Species	**Amphibians**			**Impact Acreage**							
	CALIFORNIA TIGER SALAMANDER (*Ambystoma californiense*) - **Aquatic**	FT	CSC/C€	0	2.75	5.70	0	0[c]	0	0	0.00
	CALIFORNIA TIGER SALAMANDER (*Ambystoma californiense*) - **Upland**	FT	CSC/C€	3.39	0	8.45	0	0[c]	0	0	0.00
	CALIFORNIA TIGER SALAMANDER (*Ambystoma californiense*) *CRITICAL HABITAT*	D	P	0	0	0	0	0	0	0	0
	Reptiles			**Impact Acreage**							
	BLUNT-NOSED LEOPARD LIZARD (*Gambelia (=Crotaphytus) sila*)	FE	SE/FP	0	0	0	0	0	0	0	0
	Birds			**Impact Acreage**							
	SWAINSON'S HAWK (*Buteo swainsoni*)	--	ST	311.74	282.23	362.96	347.25	373.98	134.68	216.87	246.24
	MOUNTAIN PLOVER (*Charadrius montanus*)	FPT*	--	72.50	28.34	50.36	79.79	84.02	0	0	0.00
	WHITE-TAILED KITE (*Elanus leucurus*)	--	FP	311.74	282.23	362.96	347.25	373.98	134.68	216.87	246.24
	Mammals			**Impact Acreage**							
	NELSON'S (SAN JOAQUIN) ANTELOPE SQUIRREL (*Ammospermophilus nelsonii*)	--	ST	0	0	0	0	0	0.13	0.01	2.64
	FRESNO KANGAROO RAT (*Dipodomys nitratoides exilis*)	FE	SE	1.44	0	0	0	0	0	0	0.00
	FRESNO KANGAROO RAT (*Dipodomys nitratoides exilis*) *CRITICAL HABITAT*	D	--	0	0	0	0	0	0	0	0
	TIPTON KANGAROO RAT (*Dipodomys nitratoides nitratoides*)	FE	SE	0	0	0	0	0	0.13	0.01	2.64
	SAN JOAQUIN KIT FOX (*Vulpes macrotis mutica*)	FE	ST	423.91	311.80	377.94	392.11	406.35	164.28	235.66	248.99
	Natural Preserves and Biologically Sensitive Habitat Areas			**Number of Protected lands within 500 feet; impacted acreage**							
Parklands, State and Federal Protected Lands	City Parks: number within a 500 foot radius			0	0	0	1	0	0	0	0
	City Parks: acres impacted			0	0	0	0	0	0	0	0
	Special District Areas within a 500 foot radius			0	0	0	0	0	1	0	0
	Special District Areas within a 500 foot radius			0	0	0	0	0	0	0	0
	State Wildlife Reserves : impacted acres			0	0	0	0	0	0	0	0
	State Wildlife Reserves: acres impacted			0	0	0	0	0	0	0	0
	State Parks of Historical Significance: within a 500 foot radius			0	0	0	0	0	0	0	0
	State Parks of Historical Significance: acres impacted			0	0	0	0	0	0	0	0
	National Wildlife Refuges within a 500 foot radius			0	0	0	0	0	0	0	0
	National Wildlife Refuge: acres impacted			0	0	0	0	0	0	0	0
Designated Recovery Areas per USFWS Recovery Plans				**Impact Acreages**							
	San Joaquin Upland Species Linkage Areas			0	0	0	0	0	37.65	47.68	46.66
	San Joaquin Upland Species Satellite Areas (Pixley/Allensworth)			33.00[d]	16.48[d]	41.13[d]	32.77[d]	39.47[d]	0	0	0
California Missing Linkages Areas	**General Wildlife Linkages**			**Alignment crosses Linkage**							
	Kings River			yes	yes	yes	yes	yes	no	no	no
	St. John's River–Cross Creek			no	yes	yes	yes	yes	no	no	no
	Highway 43–Garces Highway			yes	yes	yes	yes	yes	no	no	no
	Tule River			no	no	no	no	no	no	no	no
	Deer Creek–Sand Ridge			no	no	no	no	no	no	no	no
	Poso Creek			no	no	no	no	no	yes	yes	yes
	Kern River			no	no	no	no	no	no	no	no
Agricultural Lands	**Farmland Mapping and Monitoring Program Status**			**Impact Acreage**							
	Prime farmland			121.29	89.46	89.58	92.78	98.33	125.70	222.09	242.06
	Farmland of statewide importance			133.40	143.81	219.25	173.71	204.51	0	0	0
	Unique farmland			60.59	37.60	39.25	57.31	57.83	0	0	0.18
	Farmland of local importance			2.44	0	0	0	0	0	0	0

Comparison of Alternatives Considered in the Hanford, Corcoran, Wasco, and Shafter Area

Alternatives[a]		Hanford West	Hanford East *(BNSF - Through Corcoran on*	Corcoran Bypass *(BNSF - Corcoran Bypass on Map*	Kaweah Bypass *(Part of BNSF Alternative Carried*	Kaweah/Corcoran Bypass *(Corcoran Bypass Carried*	BNSF - Through Wasco and Shafter *(Part of BNSF Alternative Carried*	Wasco-Shafter Bypass *(Wasco-Shafter Bypass*	Wasco-Shafter-7th Standard Road Bypass
Additional Standard Criteria		**Impacts as reported in June 2010 Alternatives Analysis Report**							
Disruption to Communities	**Residential Displacements (parcels)**	11	10	13	12	31[f]	4	1	0
	Commercial/ Industrial Displacements (parcels)	21	14	1	25	1	62[g]	2	3
	Properties with access affected	Would affect properties in Armona	Would affect properties in Corcoran	None	Would affect properties in Corcoran	None	Would affect properties in Wasco and Shafter	None	None
	Local traffic effects around stations	Convenient and direct access to SR-198	Convenient and direct access to SR-198	NA	NA	NA	NA	NA	NA
	Local traffic effects at grade separations	Change in level of service not expected to have large impact on local traffic							
Design Objectives	**Travel time**	No Significant Difference Among Alternatives							
	Route length	35.44	36.81	36.61	37.42	37.55	21.6	20.71	20.65
	Intermodal connections	Potential opportunity to establish connection with future commuter service on Cross Valley Railroad	Potential opportunity to establish connection with future commuter service on Cross Valley Railroad	None	None	None	None	None	None
	Capital costs	Requires elevated structure over San Joaquin Valley Railroad and	Requires 1 BNSF crossing	Requires crossing Tulare Lake Mitigation Site, possibly on	Requires 1 BNSF crossing	Requires 2 BNSF crossings	Requires elevated structure through Wasco and Shafter	Requires 1 BNSF crossing	Requires 1 BNSF crossing
	Operating costs	Similar among alternatives							
	Maintenance costs	At-grade in separate right-of-way. Does not parallel existing roads.	At-grade in separate right-of-way. Does not parallel existing roads.	At-grade in separate right-of-way. Does not parallel existing roads. Passes through wetlands increasing off-track maintenance difficulties.	At-grade in separate right-of-way. Does not parallel existing roads.	At-grade in separate right-of-way. Does not parallel existing roads.	Highest maintenance cost due to length of viaducts.	Low maintenance cost	Low maintenance cost
Land Use	**Potential for transit oriented development**	Armona Community Plan and Kings County General Plan designate the area in the vicinity of the alignment as agriculture, limited agriculture, residential, and residential commercial.	Hanford General Plan designates over 160 acres near the station site as Planned Highway Development, which anticipates development oriented to higway travelers. Conversely, Kings County has zoned the unincorporated portion of the station site as agriculture.	NA	NA	NA	NA	NA	NA

Comparison of Alternatives Considered in the Hanford, Corcoran, Wasco, and Shafter Area

Alternatives[a]		Hanford West	Hanford East *(BNSF - Through Corcoran on*	Corcoran Bypass *(BNSF - Corcoran Bypass on Map*	Kaweah Bypass *(Part of BNSF Alternative Carried*	Kaweah/Corcoran Bypass *(Corcoran Bypass Carried*	BNSF - Through Wasco and Shafter *(Part of BNSF Alternative Carried*	Wasco-Shafter Bypass *(Wasco-Shafter Bypass*	Wasco-Shafter-7th Standard Road Bypass
	Consistency with other planning efforts	Traverse designated agricultural land except in vicinity of Hanford and Armona.	Traverses designated agricultural land.	Traverses designated agricultural land.	Traverses designated agricultural land except in Corcoran.	Traverses designated agricultural land.	Traverses designated agricultural land except in Wasco and Shafter.	Traverses designated agricultural land.	Traverses primarily designated agricultural land except for entitled Rosedale Ranch master-planned community covering 1,650 acres.
Constructability	**Constructability**	Access difficult as alignment is away from ready access.	Access difficult as alignment is away from ready access.	Alignment within 2 miles of SR 43. Most construction unconstrained by BNSF operations.	Alignment within 2 miles of SR 43. Most construction unconstrained by BNSF operations.	Alignment within 2 miles of SR 43. Most construction unconstrained by BNSF operations.	Requires construction of long viaducts through towns. Construction access difficult through Wasco and Shafter.	Simple to construct. Construction access would be straightforward.	Simple to construct. Construction access would be straightforward.
	Disruption to existing railroads	Conflicts with freight facilities at Corcoran.	Conflicts with freight facilities at Conejo and Corcoran.	No major conflicts with existing railroads.	Conflicts with freight facilities at Corcoran.	Conflicts with freight facilities at Corcoran.	Impacts to BNSF operations during construction. Remodeling of sidings in Wasco.	Sever 3 sidings at Crome.	No disruption to existing railroad operations.
	Disruption to and relocation of utilities reported as number of major electric transmission lines intersected	6	9	8	7	8	3	3	3
	Noise and Vibration (number of sensitive receptors)	648 residences[h]	488 residences[h]	87 residences	521 residences[h]	156 residences	1,305 residences[h]	156 residences	139 residences
	Visual/scenic resources	0 residential parcels within 1/4 mile of elevated structures.[j]	475 residential parcels within 1/4 mile elevated structures.[i]	39 residential parcels within 1/4 mile of elevated structures	45 residential parcels within 1/4 mile of elevated structures	44 residential parcels within 1/4 mile of elevated structures	1,320 residential parcels within 1/4 mile of elevated structures.[i]	30 residential parcels within 1/4 mile of elevated structures	0 residential parcels within 1/4 mile of elevated structures.[j]
	Geotechnical constraints	No major geotechnical constraints							
	Hazardous materials (number of sites)	3	3	0	3	3	2	0	0

Federal Status	**State Status**
FE – Endangered	SE – Endangered
FT – Threatened	ST – Threatened
D = Designated critical habitat	C(E) – Candidate for Endangered listing status
FD = Delisted. Status to be monitored for 5 years.	CSC – California Species of Special Concern
FPT – Proposed for Federal Threatened status	FP – California Fully Protected species
-- = No status designation.	-- = No status designation.

[a]See Maps T-1 and T-2 for location of alternatives.

[b]These vernal pools are located east of the BNSF Railway tracks just north of Corcoran in the vicinity of the Tulare Lake Mitigation Site. This is a portion of the original BNSF Alternative Alignment that has since been dropped in favor of the Kaweah Bypass. That bypass avoids these wetlands.

[c] The Kaweah/Corcoran Bypass Alternative largely avoids suitable natural habitats (i.e., annual grasslands, alkali desert scrub, vernal pool habitat) with the potential to support special-status plant and/or wildlife species.

[d] The Hanford East and Hanford West Alternatives follow the same alignment through the impacted recovery area. The Hanford East would be constructed on viaduct and has a 50-foot wide footprint, whereas the Hanford West would be constructed at-grade and has a 100-foot wide footprint. The remaining Alternatives occur along different (longer) alignments through the recovery area and all have a 100-foot wide footprint.

[e] The Corcoran Bypass Alternative occurs in natural areas identified predominantly as annual grasslands, whereas the Hanford East Alternative occurs in an area mapped predominantly as a Holland vernal pool area.

[f] Potential residential displacements are higher for the Kaweah/Corcoran Bypass alternative because the project intersects communities north of the City of Corcoran.

[g] Potential commercial and industrial displacements are higher for the BNSF through Wasco-Shafter alternative because the project intersects businesses in the Cities of Wasco and Shafter.

[h]Potential sensitive receptors are higher for alternatives passing through urban areas.

[i]The number of residences within 1/4 mile of elevated structures are higher for those alternatives that are elevated through urban areas.

[j]There are no elevated sections along the Hanford West and Wasco-Shafter 7th Standard Road Bypass.

Attachment G
Other Information on Alternatives

Revision 1 (May 26, 2011)

Additional Information on Alternatives for the Fresno to Bakersfield Section of the California High-Speed Train Program

Vertical Profile Alternatives

City of Fresno

At the beginning of the project analysis in the Fresno area, the Authority and FRA considered high-speed train (HST) alignment options at grade, below grade, and on an elevated structure. A combined at-grade and aerial option was also considered for the 6,000 feet of station tracks with the through tracks at-grade and elevated station tracks above them (stacked tracks).

Based on conceptual designs, at-grade and below-grade options through Fresno were eliminated during the initial analysis of alternatives to avoid infrastructure conflicts and traffic impacts. The use of a stacked track arrangement in the station area was also eliminated because it did not substantially reduce right-of-way requirements or project impacts and was substantially more expensive than other alternatives.

Preliminary engineering of an elevated design for the project resulted in a 14-mile-long elevated structure through Fresno that needed to be 65 to 70 feet above grade to cross existing infrastructure, such as State Route (SR) 180 and SR 41. The City of Fresno expressed strong concern regarding the impacts of this design because of its height and mass. This structure would visually dominate the city landscape, and potential noise from the train could extend out as much as 3,300 feet from the elevated alignment. City staff is concerned that this scale of structure could substantially change the character of downtown Fresno.

The Authority has worked with the City of Fresno over the past four months to resolve this concern. This effort has focused on developing a plan to bring the HST through Fresno largely at grade with minimal disruption to the existing transportation network. The Authority and the City have completed this plan. A modified at-grade HST design through Fresno has been developed with only 1 mile of lower elevated structure to cross existing roads and rail lines and a trench approximately 1.5 miles long to cross beneath other rail lines and SR 180. This plan maintains an efficient roadway network in downtown Fresno. The attached Figure G-1 shows where the HST alignment would be below-grade, at-grade, and elevated through Fresno.

An elevated “cross-over” alternative was considered in Fresno that traveled on the east side of the UPRR tracks from Clinton Avenue south to Belmont Avenue where it then crossed over to the west side of the UPRR tracks at a shallow angle and continue through Fresno on the west side of the UPRR. This cross over alignment was determined not to be practicable for an at-grade alternative. An at-grade cross over alternative would require two long, skewed crossings beneath the UPRR tracks in a tunnel or covered trench; one 4,000 feet long and the other 3,400 feet long. This would make the total trenching for the alternative 15,000 feet long as compared to 7,800 feet for the alternative being carried forward in the EIR/EIS. It is also unlikely that UPRR operations could continue during construction of these crossings beneath railroad.

City of Corcoran

The initial evaluation of the vertical alignment options adjacent to the BNSF through Corcoran also favored an elevated structure to minimize infrastructure conflicts, right-of-way requirements, and traffic impacts. The elevated guideway design through Corcoran would be approximately 40 feet high and would be located on the east side of the BNSF.

The Authority is also considering a design crossing through Corcoran at grade on the west side of the BNSF Railway tracks. The Authority is working with the City of Corcoran to develop an at-grade alignment that would avoid major disruption to the local roadway network or interference with industry that uses

the BNSF. Both of these vertical alignment alternatives, which are shown in Figure G-2, are being carried forward in the EIR/EIS.

Cities of Wasco and Shafter

An at-grade alignment would conflict with and cut off numerous BNSF rail spurs to customers in Wasco and Shafter, and would require substantial disruption of the local road network during project construction. For these reasons, the HST alignment through these two communities would be elevated.

City of Bakersfield

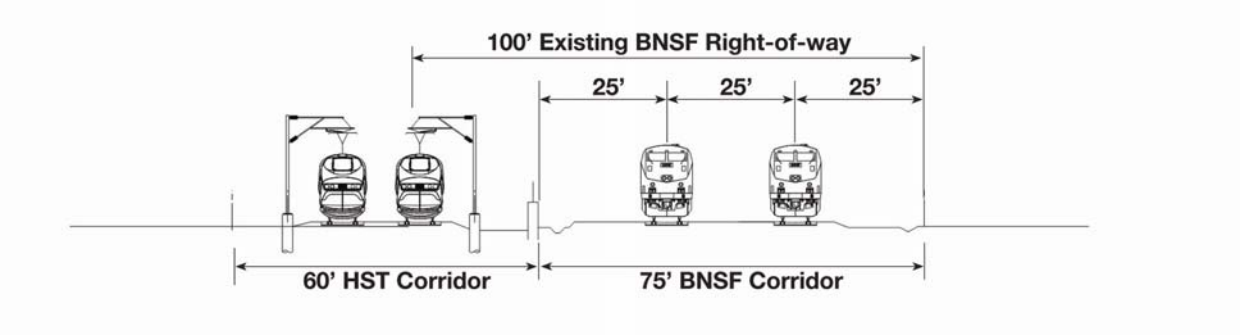
To enter downtown Bakersfield along the BNSF alignment, it is necessary to cross the Kern River, SR 99, and several major local roads on an elevated structure. Once across SR 99, it is only 2 miles to the proposed Bakersfield station location adjacent to the existing Amtrak station. Bringing the alignment back down to grade before the station would require twice the right-of-way as an elevated structure, resulting in the removal of numerous commercial and government buildings in the downtown area. It is not practicable to develop an entirely at-grade design in Bakersfield and as a result a modified elevated alignment will be carried forward.

In the initial design, the elevated structure through Bakersfield began at Rudd Avenue, about 2 miles northwest of Rosedale on the outskirts of Metropolitan Bakersfield. To reduce costs and minimize visual impacts to surrounding residential neighborhoods, the elevated structure has been moved approximately 4.5 miles south of this point to Palm Avenue. Figure G-3 shows the location of these elevated structures.

SHARED VERSUS ADJACENT RIGHT-OF-WAY

The Authority evaluated the shared use of the BNSF right-of-way where the HST alignment runs parallel with the BNSF tracks. In this concept of shared right-of-way, the BNSF tracks would be moved to one side of the right-of-way, retaining enough width for future provision of two BNSF tracks in locations where there currently is only one track. The HST alignment would be placed in a combined right-of-way made up of a portion of the BNSF right-of-way, and new right-of-way. A typical cross section of this concept is provided below.

Typical Cross Section for Shared Right-of-Way



Locating the HST less than 100 feet from a freight rail requires construction of a barrier between the two sets of tracks to avoid a train-to-train collision in the event of a derailment. When the HST and freight tracks are about 33 feet apart or less, a substantial engineered wall would be required to safely separate the two. While it is technically feasible to construct a barrier that can contain a derailed train, freight rail operators continue to be concerned with the safety and liability issues associated with potential accidents in a shared right-of-way.

As indicated above, in most places where the HST alignment runs parallel to the BNSF tracks, it would be necessary to move those tracks to one side of the right-of-way in order to make room for the HST and a safety barrier. This creates substantially more complex construction staging requirements for the project.

A combination of safety and liability concerns and increased construction complexity could make a shared right-of-way between BNSF and the HST undesirable. While the Authority continues to explore the possibility of shared right-of-way with BNSF (particularly through very sensitive areas), the potential to reach an agreement with BNSF to utilize portions of their right-of-way remains uncertain. Therefore, the Fresno to Bakersfield Section Draft EIR/EIS assumes there would be no shared right-of-way, and the HST alignment would be located at least 100 feet from the BNSF railbed where the two lines would be parallel. This would provide a worse-case estimate of the potential environmental impacts associated with the project.

HANFORD WEST, HANFORD EAST, AND THROUGH HANFORD ALIGNMENT ALTERNATIVES

An HST alignment west of Hanford would forego the opportunity to provide a station for the Hanford/Visalia/Tulare region. A station on a western alignment would serve the communities of Lemoore and Hanford but would be too far west to capture a large number of travelers from Visalia and Tulare. The 20-mile diameter catchment area for a station on an HST alignment east of Hanford would have the greatest existing and projected population of any of the station sites considered for the project in the Hanford/Visalia/Tulare region (see Table 8 of the *Visalia-Tulare-Hanford Station Feasibility Study*).

An HST alignment west of Hanford would also be inconsistent with local land use planning. A good portion of the residential growth in the incorporated cities of Hanford and Lemoore and the unincorporated "Community District" of Armona is filling in the area between the two cities with residential development centered on SR 198. An HST alignment alternative west of Hanford would split this residential growth pattern. In contrast, the Hanford East Alternative being carried forward is located on the eastern edge of the Hanford sphere of influence within an area designated as "urban fringe" by Kings County. Urban fringe represents the residential, commercial, and industrial land uses immediately adjacent to the cities of Corcoran, Hanford, and Lemoore, and includes the Kings County unincorporated islands surrounded by the City of Hanford. These areas are generally within a city's primary sphere of influence. Kings County continues to direct urban growth within the urban fringe areas to cities for annexation. The proposed HST station site is located near the SR 43 and SR 198 interchange on land that is zoned by Kings County as Light Industrial (ML) (Kings County Zone Map No. 302.047).

An alignment alternative west of Hanford would result in greater impacts to waters of the U.S., habitat for threatened or endangered plants and animals, and farmland than the Hanford East Alternative. Both alternatives would have approximately the same number of residential displacements. The Hanford West Alternative would impact 1/3 more commercial and industrial parcels and would result in substantially more noise impacts to residences than the Hanford East Alternative. Visual impacts would be greater with the Hanford East Alternative than the Hanford West Alternative because the station for the Hanford East Alternative would be elevated and more visible than the at-grade station that would be used for the Hanford West Alternative. The Hanford West Alternative would impact 2 acres of seasonal wetlands, waters of the U.S., and riparian habitat. This alternative would also impact 4.7 acres of canals, ditches, and retention/detention basins. The Hanford East Alternative would impact no seasonal wetlands, about 0.9 acre of waters of the U.S. and riparian habitat, and about 2.8 acres of canals, ditches, and retention/detention basins. The Hanford West alternative would impact 5 acres more of habitat for threatened or endangered plants and 210 acres more of habitat for threatened or endangered animals than the Hanford East Alternative. Finally, the Hanford West Alternative would impact 47 acres more important farmland, including 32 acres of prime farmland, than the Hanford East alternative. Please see Attachment F, which provides a comparison of these and other alignment alternatives based on the selection criteria for the project.

In response to public concerns over the potential impacts to agricultural lands and operations of the Hanford East Alternative, the Authority identified two alignment options (H1 and H2) that would essentially follow the BNSF corridor through Hanford, rather than bypassing the city to the east. The two options, which differ principally in terms of the location of a potential station in Hanford, remain essentially parallel to the BNSF right-of-way through southern Fresno County (including the community of Laton) and into Kings County before entering Hanford. The alignments would diverge from the BNSF alignment between the Kings River and approximately Excelsior Avenue in Kings County as the BNSF alignment geometry cannot accommodate high-speed train geometry. South of Hanford, the alignments would stay along the BNSF alignment before reaching Corcoran, at which point they would join the alignment alternatives carried forward for that area (i.e., through-town or bypass). Again, the alignments would diverge from the BNSF alignment north of Kansas Avenue because of track geometry. To avoid excessive community disruption and provide sufficient clearance above the Cross-Valley Railroad tracks, BNSF spur tracks, and SR-198, both options would be on elevated structures through Hanford and for considerable distances to the north and south.

The alternative alignments through Hanford were eliminated from further consideration primarily for their impacts to Hanford. Both alternatives would result in substantial displacements to residential, commercial, industrial, and public properties on the western side of the city. The through Hanford alternatives would result in the following increase in displacements relative to the Hanford East Alternative:

- 32-42 residential parcels
- 14-21 commercial parcels
- 24-26 industrial parcels
- 30-34 public parcels

BAKERSFIELD ALTERNATIVE ALIGNMENTS

Two sets of alternatives were evaluated for the HST alignment through the Bakersfield metropolitan area: Alternatives D1-N and D1-S and Alternatives D2-N and D2-S. Both sets of alternatives traverse and parallel the Westside Parkway south of the Flying J Refinery and across the Kern River into central Bakersfield. Alternatives D1-N and D1-S traverse the BNSF rail yard and displace the Industrial Arts Building on the Bakersfield High School on their way into the proposed station site at Truxtun Avenue north of the Mill Creek Redevelopment Area. East of the station, Alternatives D1-N and D1-S roughly parallel East Truxtun Avenue through a largely commercial and industrial area of East Bakersfield.

Alternative D1-N would continue east to cross over the UPRR Kern Junction Yard on a skewed elevated structure. By remaining north of the UPRR, Alternative D1-N would pass through residential areas, displacing over 40 homes and an electrical substation.

Alternative D1-S would remain on the southern side of the UPRR right-of-way, paralleling Edison Highway on the west and coming to grade near Oswell Street. This alternative would displace more businesses than Alternative D1-N and would sever perpendicular access roads at Edison Highway.

Alternative D1-N was eliminated from further consideration because it was determined that the long, highly skewed structure required to cross the UPRR would not be practicable to construct, it would have the highest number of residential displacements of any of the alignment alternatives evaluated in Bakersfield, and it would displace an electrical substation. Alternative D1-S was carried forward into the EIR/EIS analysis.

Alternatives D2-N and D2-S cross central Bakersfield several hundred feet north of D1-N and D1-S. Alternative D2-N is just north of the BNSF rail yard, crossing commercial properties fronting 16th Street

until it starts curving south into the station site south of Truxton Avenue. Alternative D1-S crosses the northern side of the BNSF rail yard and then is located over the BNSF mainline for almost 3 miles into the station site.

The City of Bakersfield Economic and Community Development Department has identified a 200 foot setback south of the BNSF mainline near the existing Amtrak Station to accommodate an HST station and associated facilities north of the Mill Creek Redevelopment Area. The station platform for Alternatives D1-N and D1-S is within this setback. The station platform for Alternatives D2-N and D2-S is located in the Mill Creek Redevelopment Area. Although the platform for Alternatives D2-N and D2-S could be positioned to avoid currently planned redevelopment projects, integration with future redevelopment plans could be problematic.

East of the station site, Alternatives D2-N and D2-S are on the same alignment which swings south and roughly parallels East California Avenue through the East Bakersfield community. Several houses, small businesses, and a church would be displaced by the D2 alternatives in East Bakersfield.

Alternative D2-S was eliminated from further consideration because construction of a 3-mile long elevated structure traversing the BNSF rail yard and continuing over the top of the BNSF mainline was judged not to be practicable. Alternative D2-N was carried forward into the EIR/EIS analysis.

A hybrid alternative was considered through Bakersfield that follows Alternative D2-N in central Bakersfield with the Alternative D1-S station location and alignment east of the station. Such an alternative alignment would not allow the HST to operate at speeds greater than approximately 120 mph through Bakersfield which is not consistent with the design parameters established for the project and would jeopardize mandated travel times between San Francisco and Los Angeles. Straightening the curves in this hybrid alternative in the vicinity of the station site to meet design speeds would cause the alignment to run through the Rabobank Arena, Theater, and Convention Center and Kern County Administrative Building. Because the hybrid alternative either would not meet the purpose of the project or would result in a substantial impact to important community facilities, this alternative was not carried forward in the EIR/EIS.